MUNICIPAL STORMWATER MANAGEMENT PLAN

Borough of Morris Plains
Morris County, New Jersey

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1. Hydrologic Cycle
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* Provided for informational purposes only as build-out analysis not required.
Introduction

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for the Borough of Morris Plains ("the Borough") to address stormwater related impacts. The creation of this plan is required by N.J.A.C. 7:14A-25 Municipal Stormwater Regulations. This plan contains all of the required elements described in N.J.A.C. 7:8 Stormwater Management Rules. The plan addresses groundwater recharge, stormwater quantity standards for new major development, defined as projects that disturb one or more acres of land. These standards are intended to minimize the adverse impact of stormwater runoff on water quality and water quantity and the loss of groundwater recharge that provides base flow in receiving water bodies. The plan describes long-term operation and maintenance measures for existing and future stormwater facilities.

This plan also addresses the review and update of existing ordinances, the Borough Master Plan, and other planning documents to allow for project designs that include low impact development techniques. In addition, the plan includes a mitigation strategy for when a variance or exemption of the design and performance standard is sought. As part of the mitigation section of the stormwater plan, specific stormwater management measures are identified to lessen the impact of existing development.

MSWMP Goals

The goals of this MSWMP are to:

- Reduce flood damage, including to life and property;
- Minimize, to the extent practical, any increase in stormwater runoff from any new development;
- Reduce soil erosion from any development or construction project;
- Assure the adequacy of existing and proposed culverts and bridges, and other instream structures;
- Maintain groundwater recharge
- Prevent, to the greatest extent feasible, an increase in nonpoint pollution;
- Maintain the integrity of stream channels for their biological functions, as well as for drainage;
- Minimize pollutants in stormwater from new and existing development to restore, enhance and maintain the chemical, physical, and biological integrity of the waters of the state, to protect public health, to safeguard fish and aquatic life and scenic and ecological values and to enhance the domestic, municipal, recreational, industrial, and other uses of water; and
- Protect public safety through the proper design and operation of stormwater basins.

To achieve these goals, this plan outlines specific stormwater design and performance standards for new development. Additionally, the plan proposes stormwater management controls to address impacts from existing development. Preventive and corrective maintenance strategies are included in the plan to ensure long-term effectiveness of stormwater management facilities. The plan also outlines safety standards for stormwater infrastructure to be implements to protect public safety.
Stormwater Discussion

Land development can dramatically alter the hydrologic cycle (see Figure 1) of a site and, ultimately, an entire watershed. Prior to development, native vegetation can either directly intercept precipitation or draw that portion that has infiltrated into the ground and return it to the atmosphere through evaporation. Development can remove this beneficial vegetation and replace it with lawn or impervious cover, reducing the site’s evaporation and infiltration rates. Clearing and grading a site can remove depressions that store rainfall. Construction activities may also compact the soil and diminish its infiltration ability, resulting in increased volumes and rates of stormwater runoff from the site. Impervious areas that are connected to each other through gutters, channels, and storm sewers can transport runoff more quickly than natural areas. This shortening of the transport or travel time quickens the rainfall-runoff response of the drainage area, causing flow in downstream waterways to peak faster and higher than natural conditions. These increases can create new and aggravate existing downstream flooding and erosion problems and increase the quantity of sediment in the channel. Filtration of runoff and removal of pollutants by surface and channel vegetation is eliminated by storm sewers that discharge runoff directly into a stream. Increase in impervious area can also decrease opportunities for infiltration which, in turn, reduces stream base flow and groundwater recharge. Reduced base flows and increased peak flows produce greater fluctuations between normal and storm flow rates, which can increase channel erosion. Reduced base flows can also negatively impact the hydrology of adjacent wetlands and the health of biological communities that depend on base flows. Finally, erosion and sedimentation can destroy habitat from which some species cannot adapt.

In addition to increases in runoff peaks, volumes, and loss of groundwater recharge, land development often results in the accumulation of pollutants on the land surface that runoff can mobilize and transport to streams. New impervious surfaces and cleared areas created by development can accumulate a variety of pollutants from the atmosphere, fertilizers, animal wastes, and leakage and wear from vehicles. Pollutants can include metals, suspended solids, hydrocarbons, pathogens, and nutrients.

In addition to increased pollutant loading, land development can adversely affect water quality and stream biota in more subtle ways. For example, stormwater falling on impervious surfaces or stored in detention or retention basins can become heated and raise the temperature of the downstream waterway, adversely affecting cold water fish species such as trout. Development can remove trees along stream banks that normally provide shading, stabilization, and leaf litter that falls into streams and becomes food for the aquatic community.

Background

The Borough of Morris Plains encompasses 2.5 square miles in the central part of Morris County. The Borough land is predominantly residential, with lesser portions in office, business and commercial zones. (See Fig.: Zoning Districts)

The land use and streams of the Borough are shown in Figure 3. Watawong Brook is the main watercourse in the Borough. This stream is a tributary of the Whippany River.
Watnong Brook has a drainage area in Parsippany-Troy Hills of approximately 1,840 acres upstream of the Borough. When Watnong Brook exits the Borough it has a drainage area approximately 3,720 acres which is an increase of 1,820 acres.

This 1,820 acre drainage area increase results from:

Approximately 1,110 acres in the Borough

Approximately 720 acres entering the Borough from Parsippany-Troy Hills tributaries.

The remaining 490 acres in the Borough drains to the east to Johnson Road in an unnamed tributary, which eventually joins the Whippany River in Cedar Knolls.

A small portion of the Borough drainage discharges to a pond in Hanover Township.

Note: The primary source of the drainage area calculations is from the 1972 Morris County Report titled Whippany River System: Drainage Study.

According to the 2000 census, the Borough has 5,236 residents. The population decreased slightly from the 1990 census. This population decrease is opposite overall state increase of approximately 9% and the overall county increase of 12% over the same period. As there is minimal vacant land, no significant population change is expected in the future.

The Borough has 44.2 acres of vacant land. The existing zoning is shown in Figure 2. The Borough is not within the State Plan Designation PA1 Metropolitan Planning Area or in a designated center where infiltration requirements are not applicable.

The average annual groundwater recharge rates are shown graphically in Figure 4. The USGS Soil Survey information is shown on Figure 5. There are designated wetland areas in the Borough.

According to the NJDEP, “A Well Head Protection Area (WHPA) in New Jersey is a map area calculated around a Public Community Water Supply (PCWS) well in New Jersey that delineates the horizontal extent of ground water captured by a well pumping at a specific rate over a two, five, and twelve-year period of time for unconfined wells. . . . The confined wells have a fifty foot radius delineated around each well serving as the well head protection area to be controlled by the water purveyor in accordance with Safe Drinking Water Regulations (see NJAC 7”10-11.7(b)1).”

WHPA delineations are conducted in response to the Safe Drinking Water Act Amendments of 1986 and 1996 as part of the Source Water Area Protection Program (SWAP). The delineations are the first step in defining the sources of water to a public supply well. Within these areas, potential contamination will be assessed and appropriate monitoring will be undertaken as subsequent phases of the NJDEP SWAP.

As shown in Figure 6, a portion of the Borough is within a well head protection area.
Since the early 70’s, stormwater quality has been an active goal of the Borough of Morris Plains as shown by the following:

1. Borough stormwater ordinances that addressed stormwater quantity and quality.
2. Stream corridor ordinance.
3. Compliance with Residential Site Improvement Standards.
4. Adoption of recommendations of Whippany River Basin Committee.
5. Planning Board and Board of Adjustment approvals which include requirements for:
   - Detention basins
   - Infiltration basins
   - Dry wells
6. Department of Public Works activities including
   - Covered storage of all salt/sand materials
   - Proper fueling and maintenance of vehicles
   - Proper housekeeping for all DPW facilities
   - Inspection of Borough catch basins
   - Street sweeping

**Design and Performance Standards**

The Borough will adopt the design and performance standards for stormwater management measures as presented in N.J.A.C. 7:8-5 to minimize the adverse impact of stormwater runoff on water quality and water quantity and loss of groundwater recharge in receiving water bodies. The design and performance standards include the language for maintenance of stormwater management measures consistent with the stormwater management rules at N.J.A.C 7:8-5-8 Maintenance Requirements, and language for safety standards consistent with N.J.A.C. 7:806 Safety Standards for Stormwater Management Basins. The ordinances will be submitted to the County for review and approval within 24 month of the effectiveness date of the Stormwater Management Rules.

**Plan Consistency**

The Borough is not within a Regional Stormwater Management Planning Area and no TMDL’s have been developed for waters within the Borough; therefore this plan does not need to be consistent with any regional stormwater plans (RSWMPs) nor any TMDL’s. If any RSWMPs or TMDLs are developed in the future, this Municipal Stormwater Management Plan will be updated to be consistent.

The NJDEP surface water quality standard for the Whippany River (as per NJAC 7:9B1.14) is “fecal coliform levels shall not exceed a geometric average of 200/100ml nor should more than 10 percent of the total samples taken during a 30 day period exceed 400/100 ml.” The NJDEP established a Whippany River Watershed TMDL for fecal coliform. The TMDL establishes a load reduction target for fecal coliform of 58.6% to be achieved.
The Borough is within the Whippany River Basin and much information on the basin and about its characteristics has been developed as part of the Whippany River Plan.

The Municipal Stormwater Management Plan is consistent with the Residential Site Improvement Standards (RSIS) at N.J.A.C. 5:21. The Borough will utilize the most current update of the RSIS in the stormwater review of residential areas. This Municipal Stormwater Management Plan will be updated to be consistent with any future updates of the RSIS.

The Borough’s Stormwater Management Ordinance requires all new development and redevelopment plans to comply with New Jersey’s Soil Erosion and Sediment Control Standards. During construction, Borough inspectors will observe on-site soil erosion and sediment control measures and report any inconsistencies to the local Soil Conservation District.

Nonstructural Management Strategies

The Borough will revise the Borough master plan in accordance with State recommendations.

Land Use/Build-Out Analysis

Since the Borough has a vacant land area of less than one square mile, the Borough is not required to do a build-out analysis.

Mitigation Plans

Since there is minimal developable vacant land, the Borough will review the need for any mitigation options. This review will include the detailed guidance on mitigation plans, which is reportedly being distributed by NJDEP.

Recommend Implementing Stormwater Control Ordinances

The Borough currently has pet waste control, litter control, improper dumping, feeding of non-confined wildlife and yard waste ordinances in place but will need to implement an enforced illicit connections ordinances and possibly modify the existing ordinances.
Groundwater Recharge Areas for Morris Plains
WellHead Protection Areas for Morris Plains

Source:

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